Relative Clinical Benefit Of Biventricular Pacing In Cardiac Amyloidosis

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Background: Cardiac amyloidosis (CA) is associated with high rates of intrinsic conduction disease. Patients with CA and cardiac implantable electronic devices (CIED) have demonstrated an eventual reliance on ventricular pacing, regardless of initial CIED indication. We sought to investigate biventricular (BiV) pacing effects on survival, hospitalizations, and echocardiographic phenotype in patients with CA.

Methods: This retrospective cohort study was completed in a large academic medical center CA database. Overall and CIED device-specific baseline characteristics were described. During mean follow-up of 3.8 years, impact of BiV pacing on clinical data, including blood-based biomarkers, composite events, and echocardiographic phenotype was assessed.

Results: Among 50 CA patients (84% male, median age 75 years, 80% transthyretin, 20% light-chain), 26% had BiV and 74% had UV pacing at baseline. By 1 year, NT-proBNP was lower in the BiV group [median (IQR): 1932pg/mL (1608, 3195) vs. 4865pg/mL (2111, 10875); p = 0.045]. By 5 years, 29 patients experienced ≥1 composite event (death, first heart failure [HF] hospitalization, or arrhythmia hospitalization). Composite event incidence rates (IR) per 100 person-years were 38.0 with 95% confidence interval (CI) [30.2, 47.9] for first HF hospitalizations, 11.6 [7.6, 17.6] for arrhythmia hospitalizations, and 9.5 [6.0, 15.1] for all-cause mortality. The BiV group trended towards lower all-cause mortality (IR = 6.2 [1.6, 24.8] vs.10.2 [6.2, 16.6]) (**Figure 1**). In composite outcome multivariable analysis, LVEF (per 10% increase) approached significance [Hazard Ratio = 0.74 (95% CI: 0.53, 1.03); p = 0.078].

Conclusions: In this single center retrospective cohort analysis, we found that BiV pacing may reduce all-cause mortality and is associated with lower NT-proBNP levels after implant, compared to UV pacing in CA patients. The potential relative benefits of BiV pacing in the CA population merit further investigation in larger, prospective multi-center studies.
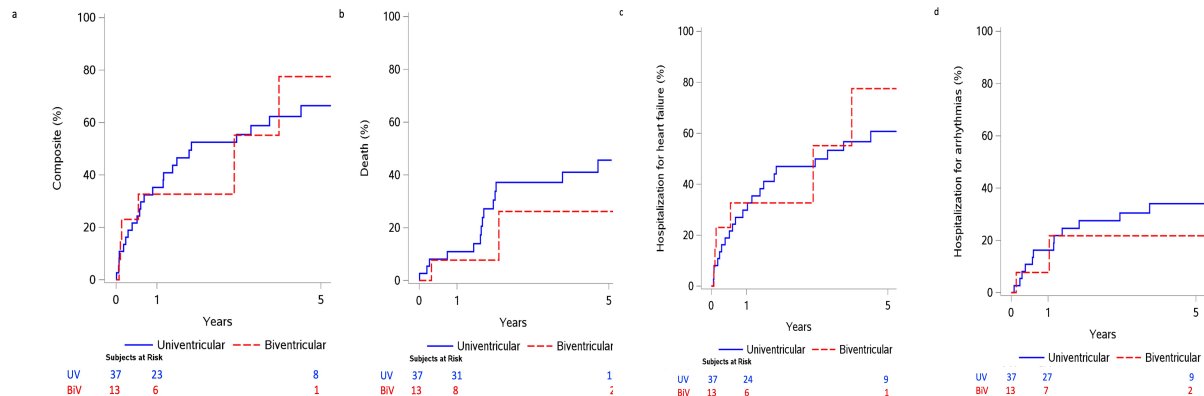

Figure 1. Rate of composite events (a), death (b), first heart failure hospitalization (c), and arrhythmia hospitalizations (d) stratified by univentricular (UV) or biventricular (BiV) CIED.